WELL ASSESSMENT REPORT
CEDAR CHEMICAL COMPANY
WEST HELENA, ARKANSAS

Revision: 0

Prepared for:

Helena Chemical Company
225 Schilling Boulevard
Collierville, Tennessee 38017

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
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www.ensafe.com

August 6, 2007

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1.0 INTRODUCTION

This Well Assessment Report (WAR) presents the information and findings from an assessment of the existing groundwater monitoring wells at the Cedar Chemical (Cedar) facility in Helena-West Helena, Arkansas. The well assessment was undertaken by EnSafe Inc. (EnSafe) and Helena Chemical (Helena) to satisfy the requirements contained in a Consent Administrative Order (CAO) LIS NO. 07-027 issued on March 26, 2007 by the Arkansas Department of Environmental Quality — Hazardous Waste Division (ADEQ). The CAO requires that site assessment activities be initiated by June 25, 2007. This well assessment effort satisfies that requirement.

2.0 SITE DESCRIPTION AND BACKGROUND

The Cedar facility consists of approximately 48 acres on State Highway 242, one mile southwest of the intersection of US Highway 49 and Highway 242 near Helena-West Helena, Arkansas. The former Cedar facility consisted of five production units and support activities which manufactured agricultural chemicals and other specialty chemicals. The *Facility Investigation Report* (EnSafe, 1995), the *Cedar Chemical Corporation Risk Assessment* (EnSafe, 2000), and the *Risk Assessment Addendum* (EnSafe, 2002) detail conditions at the Cedar site and adjacent properties.

3.0 WELL ASSESSMENT ACTIVITIES

The well assessment was conducted on June 12, 2007. Representatives from EnSafe, Helena and ExxonMobil Corporation met inspectors from ADEQ onsite. During the assessment, 37 wells were located and 35 were inspected. The wells were previously secured by ADEQ with keyed-alike locks. Two wells could not be inspected due to the fact they had locks with no keys available. The number of wells includes 27 wells previously identified and sampled in 2001, and 10 wells that could not be identified from available historic records. Due to access issues, four known offsite wells (OFFMW-1, -2, -3 and -4) were not inspected. Locations of the wells are shown on Figure 1, Appendix A.

Each well was opened and the condition of the well head checked. The wells were also sounded for depth, and the static water level was measured. The findings from the well assessment are summarized in Table 1 in Appendix B. This table includes all measurements and observations.

3.1 Well Assessment Procedures

Each well was inspected using a consistent set of procedures. These procedures are identified as follows:

1. The well inspector donned protective nitrile gloves and opened the well cover.

2. The well cover or outer steel casing were inspected for condition and any damages, and the securing lock removed.

3. The interior protective well cap on the well casing was then removed, and the condition of the inner well cap checked.

4. A static water level (Solinst®) probe was then inserted into the well and the depth of the well was measured.

5. Once the well depth was recorded, a measurement of the static water level was made and recorded.

6. If a mark was not present on the well casing, a mark was made with an indelible marker. The mark was made to record the location on the casing where the water level was measured. This mark can be used for future events to help ensure accurate water level measurements consistent with previous events.

While the well was being inspected, photographs were taken for visual documentation of the condition of the well. These photographs are provided in a photo log in Appendix C.

3.2 Decontamination

The static water level indicator was decontaminated following inspection of each well. An effective decontamination process helps ensure that wells are not cross-contaminated following water level measurements and soundings. The following decontamination steps were followed after each well was inspected:

- The stainless-steel probe and nylon tape were sprayed with a mixture of Liquinox and de-ionized water. This wash solution was used to help remove any residue, particulates, or sediment that might have adhered to the probe and tape from the well.

- Where necessary, the probe was rubbed or cleaned with a gloved hand during the wash stage.

- The probe was rinsed by continuously spraying the probe and tape with de-ionized rinse water.

- The probe was allowed a brief period to air dry prior to the next use.

In addition to these decontamination steps, the well inspections were planned to reduce chances for cross-contamination. The inspections were performed beginning with wells that had historically lower concentrations of contaminants, and progressing to wells with higher historical concentration levels.

4.0 HYDROLOGY AND GROUNDWATER FLOW

As mentioned previously, groundwater is encountered in both a discontinuous perched zone (approximately 15 to 20 feet bgs) and a regional, confined alluvial aquifer system encountered approximately 35 to 40 feet bgs. The perched zone aquifer is developed in finer grained silty, clayey sediments. The deeper upper alluvial aquifer (upper alluvium) is developed in coarser, fine to medium grained sands. The monitoring wells that were inspected have been completed at two general levels; one set in the perched zone and one set in the upper portion of the alluvial aquifer. The static water levels recorded during the well assessment have been used to construct piezometric surface maps that depict the direction of groundwater flow across the site.

4.1 Perched Zone

A piezometric surface map in Figure 2 in Appendix A of the perched zone shows a radial flow in the area of the WWTP equalization, polish, and aeration basins. The groundwater appears to flow generally to the west and south away from the WWTP area. There is little to no well coverage in the perched zone over the north half of the site, and consequently no contours are presented. The static water levels recorded in 7 wells in this aquifer ranged from 170.13 to 180.96 feet above the North American Vertical Datum (NAVD).

4.2 Upper Alluvium

A piezometric surface map in Figure 3 in Appendix A of the upper alluvial zone shows an even flow pattern with the direction of the flow to the east-southeast. The well coverage is good across the site despite the fact that a few of the wells were not used due to uncertain elevations and condition. The static water levels recorded in 12 wells in the upper alluvial aquifer ranged from 161.89 to 160.04 feet above the NAVD.

5.0 CONCLUSIONS

The PRP's have completed a well assessment that sufficiently documents the condition of the Cedar site wells and satisfies the requirements of the CAO from ADEQ. Documenting the condition of all site wells is a necessary initial task of the RI/FS process required by the CAO. The survey also provided water level measurements used to confirm the direction of flow in the two groundwater aquifers of concern beneath the site. The well assessment results are summarized as follows:

- A total of 37 wells were located and viewed at the Cedar site. These wells are completed in either an upper perched groundwater aquifer or the lower alluvial groundwater aquifer. Of the located wells, 10 are unidentified, 2 were not inspected, and 2 were found to be dry.

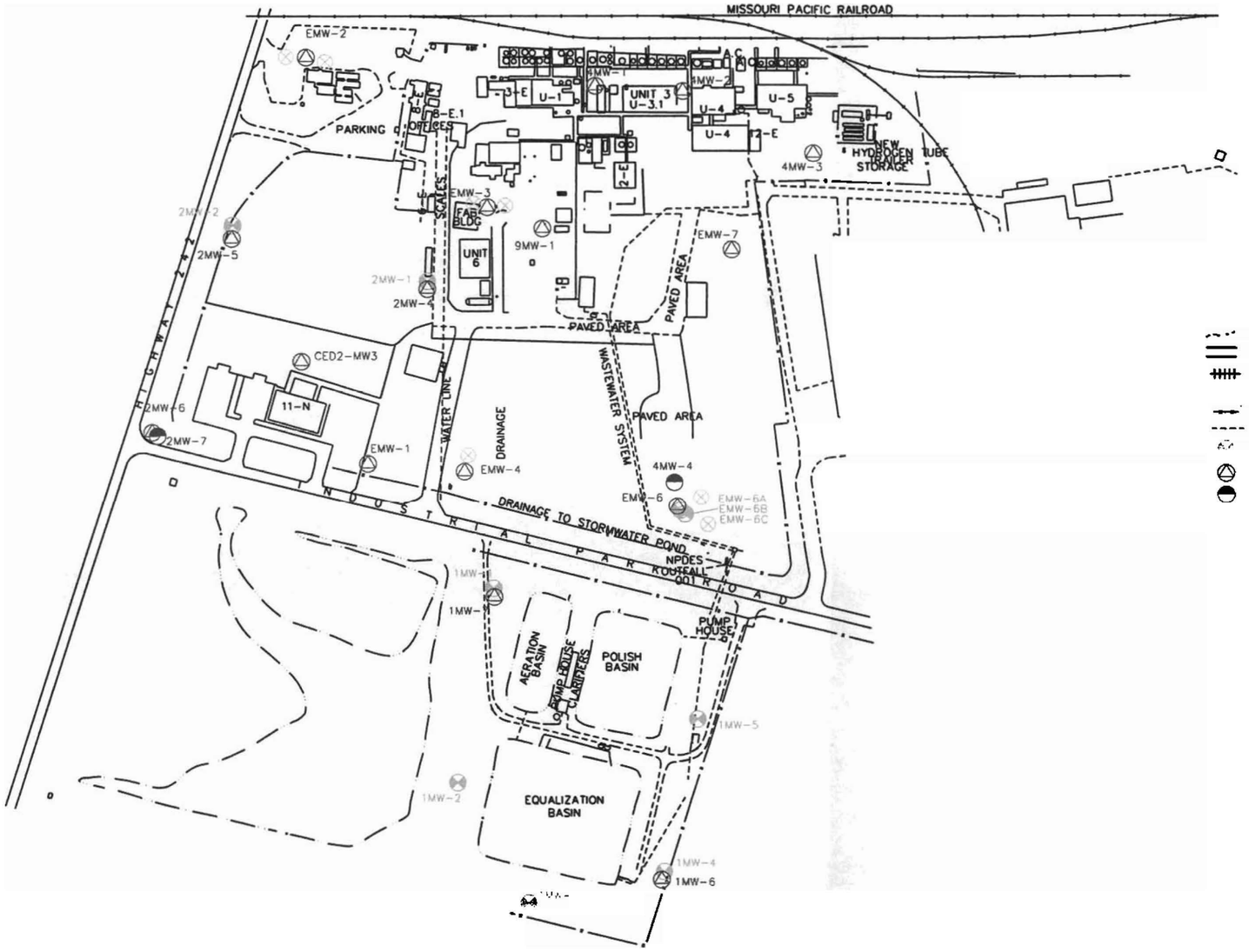
- Off-site wells were not inspected due to access issues.

- Each of the wells was inspected for condition, and a well depth and static water level were recorded. The wells were generally found to be in good condition; however, 4 wells exhibit some level of damage or disrepair and may require refurbishment. The majority of the wells will require a new inner well cap to properly secure them.

- Groundwater flow in the perched aquifer was to the west and south in a radial pattern away from the ponds on the south side of the site. Groundwater flow in the alluvial aquifer was in an even pattern to the east-southeast.

The well assessment has been concluded, and the information generated and contained in this WAR can be used in scoping subsequent RI tasks, as required.

Appendix A
Site Figures



LEGEND

- WATER OR DRAINAGE
- ROAD
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- SHALLOW MONITORING WELL (UPPER ALLUVIUM)
- DEEP MONITORING WELL (LOWER ALLUVIUM)

250 0 250

SCALE FEET

MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.

FIGURE 1
SITE MAP AND WELL LOCATIONS
CEDAR CHEMICAL
WELL ASSESSMENT REPORT

REQUESTED BY: FUEHRER	
DRAWN BY: BRONSON	
DWG DATE: 06/18/07	
DWG NO: 803072B001	

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(800) 588-7961
MEMPHIS, TENNESSEE

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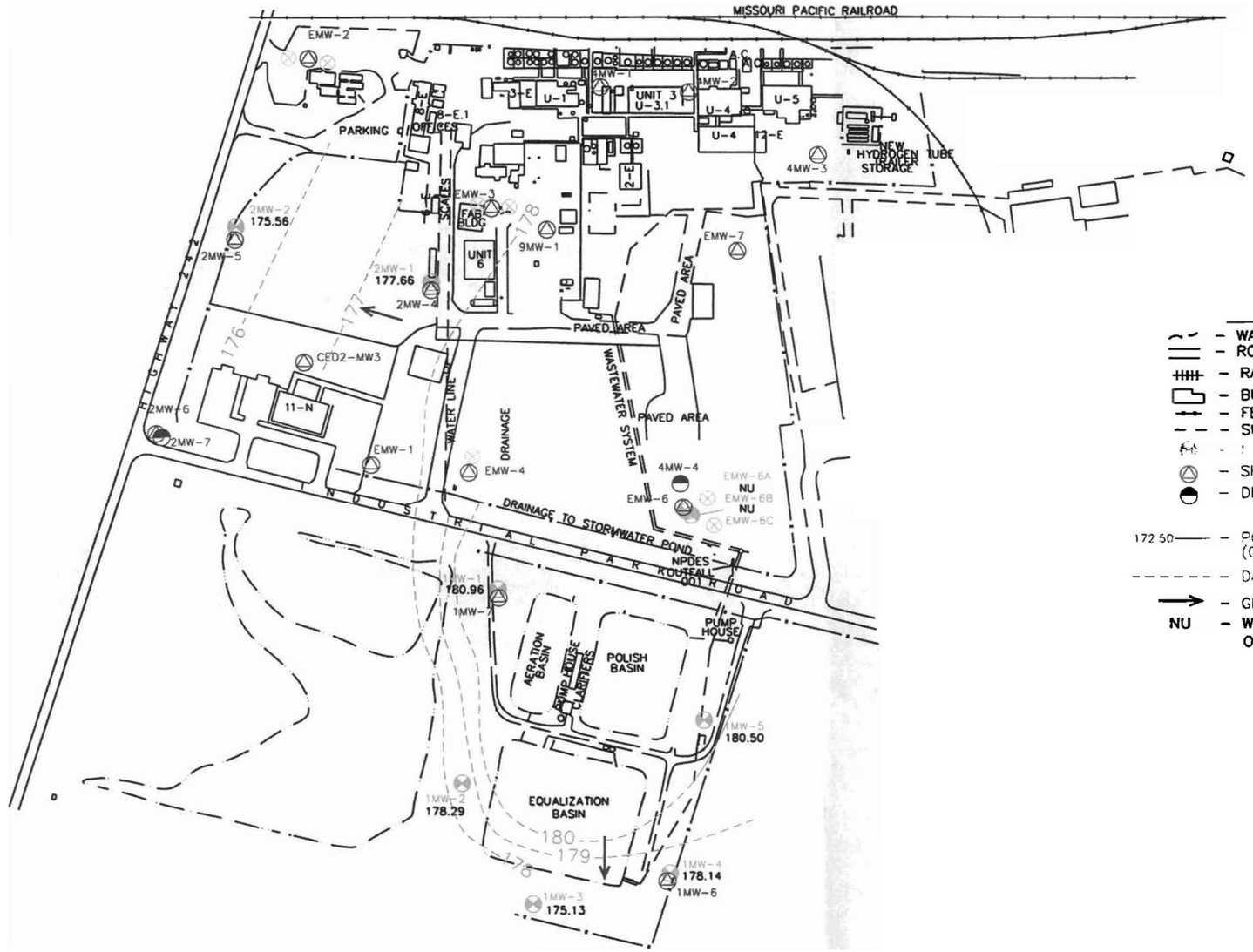

LEGEND

- WATER OR DRAINAGE
- ROAD
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- PERCHED ZONE
- SHALLOW MONITORING WELL (UPPER ALLUVIUM)
- DEEP MONITORING WELL (LOWER ALLUVIUM)

172.50 — POTENTIOMETRIC SURFACE CONTOURS (CONTOUR INTERVAL 0.25 FEET)

DASHED LINE IS AN INFERRED CONTOUR DUE TO LACK OF CONTROL

GROUNDWATER FLOW DIRECTION

NU – WELL WAS NOT USED AS IT IS NOT RELIABLE DUE TO DAMAGE OR SCREEN DEPTH. TYPICALLY PRODUCES ANOMALOUS READINGS.

250 0 250

SCALE FEET

MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.

FIGURE 2
POTENTIOMETRIC SURFACE MAP OF THE PERCHED ZONE
CEDAR CHEMICAL
WELL ASSESSMENT REPORT

REQUESTED BY: FUEHRER	
DRAWN BY: BRONSON	
DWG DATE: 06/18/07	
DWG NO: 8030728002	

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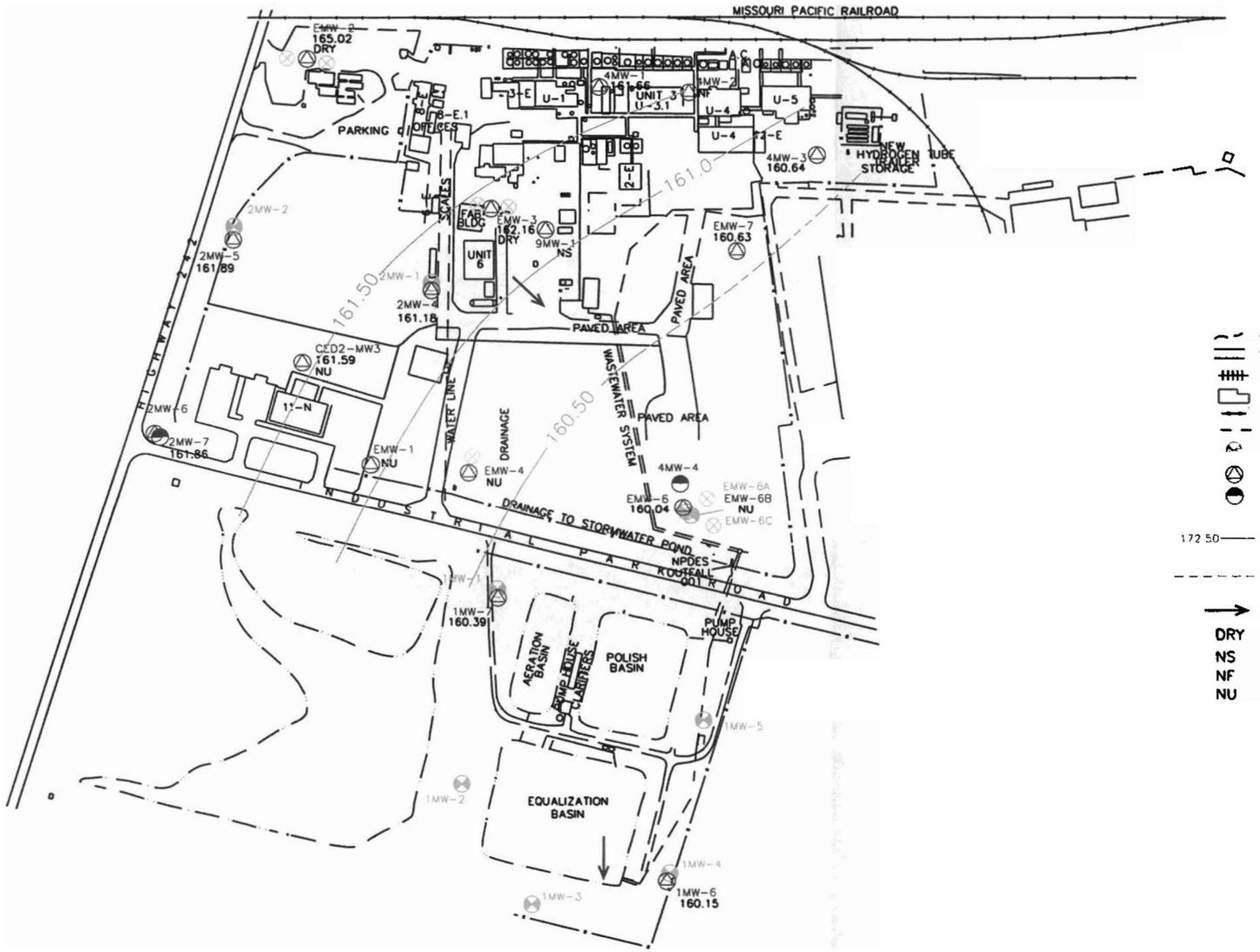

LEGEND

- WATER OR DRAINAGE
- ROAD
- RAILROAD
- BUILDING
- FENCE
- SUBSURFACE PIPING (APPRPOX.)
- SHALLOW MONITORING WELL (UPPER ALLUVIUM)
- DEEP MONITORING WELL (LOWER ALLUVIUM)

172.50 — POTENTIOMETRIC SURFACE CONTOURS (CONTOUR INTERVAL 0.25 FEET)

DASHED LINE IS AN INFERRED CONTOUR DUE TO LACK OF CONTROL

GROUNDWATER FLOW DIRECTION

DRY – NO WATER DETECTED IN THE WELL

NS – NOT SURVEYED

NF – WELL WAS NOT FOUND

NU – WELL NOT USED AS IT IS NOT RELIABLE DUE TO DAMAGE OR SCREEN DEPTH. TYPICALLY PRODUCES ANOMALOUS READINGS.

250 0 250

SCALE FEET

MAP SOURCE: DELTA PROCESS MANAGEMENT, INC.

FIGURE 3
POTENTIOMETRIC SURFACE MAP OF THE UPPER ALLUVIUM (SHALLOW)
CEDAR CHEMICAL
WELL ASSESSMENT REPORT

REQUESTED BY: FUEHRER	
DRAWN BY: BRONSON	
DWG DATE: 06/18/07	
DWG NO: 803072B003	

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MEMPHIS, TENNESSEE

C:\drew\803072B003_POT MAP_UPPER ALLUVIUM_CEDAR.dwg

Appendix B

Table 1

Tabel 1
Cedar Chemical
Static Water Elevations and Well Condition
6/12/07

Well Number	Depth of Well (Feet)	Measured Static Water Level (Feet)	Top of Casing Elevation (Feet)	Depth to Water (Feet)	Static Water Elevation (Feet)	Time	Aquifer	Condition/ Comments
1MW-1	21.1	15.49	195.43	15.49	180.96	TNA	PERCHED	Hasp broken-no lock
1MW-2	22.06	16.11	194.4	16.11	178.29	TNA	PERCHED	Good condition
1MW-3	21.91	16.36	191.49	16.36	175.13	TNA	PERCHED	Needs new expander cap
1MW-4	24.38	13.76	191.9	13.76	178.14	TNA	PERCHED	Needs new expander cap
1MW-5	21.06	13.66	194.16	13.66	180.5	1122	PERCHED	Needs new expander cap
1MW-6	35.8	31.82	191.97	31.82	160.15	TNA	UPPER	Needs new expander cap
1MW-7	54.41	35.07	195.46	35.07	160.39	TNA	PERCHED	Outer casing cover rusty/cracked
2MW-1	26.87	23.51	201.17	23.51	177.66	TNA	PERCHED	Good condition
2MW-2	26.87	24.32	199.88	24.32	175.56	1348	PERCHED	Good condition; no lock
CED2MW-3	39.1	37.17	198.76	37.17	161.59	1026	UPPER	Good condition-needs new expander cap
2MW-4	42.81	39.92	201.1	39.92	161.18	1357	UPPER	Good condition
2MW-5	40.17	38.01	199.9	38.01	161.89	1344	UPPER	Good condition; no lock
2MW-6	39.7	36.61	198.47	36.61	161.86	1018	UPPER	Good condition-cap ok
2MW-7	>100	37.16	198.7	37.16	161.54	1016	LOWER	Good condition-cap ok
4MW-1	36.79	36.03	197.69	36.03	161.66	1256	UPPER	Needs new expander cap; Flush
4MW-2	NF	NF	198.01	NF	NF	TNA	UPPER	Could not find
4MW-3	44.17	40.27	200.91	40.27	160.64	TNA	UPPER	Good condition
4MW-4	>150	44.96	202.04	41.96	160.08	1137	LOWER	Needs new expander cap
EMW-1	37.45	21.95	198.23	21.95	176.28	1007	UPPER	Good condition-needs new expander cap; TCE and DTW not reliable as of 2001 sampling
EMW-2	34.85	DRY	199.87	34.85	165.02	TNA	UPPER	Mud In bottom; Dry
EMW-3	37.15	DRY	199.31	37.15	162.16	TNA	UPPER	Outer casing bent; Dry; Soft bottom-silt?
EMW-4	35.68	18.47	198.13	18.47	179.66	1032	UPPER	Outer casing cover hinge broken; TCE and DTW data not reliable as of 2001 sampling
EMW-4B	51.62	37.18	UKN	UKN	UKN	1036	UKN	Good condition, rusted; well location is north of EMW-4
EMW-6	81.28	39.52	199.56	39.52	160.04	1146	UPPER	Needs new expander cap
EMW-6A	50.44	38.51	198.54	NA	NA	1149	UKN	Needs new expander cap
EMW-6B	30.77	15.25	198.09	15.25	182.84	1153	PERCHED	Needs new expander cap; SWE and DTW not previously used
EMW-6C	17.48	15.06	UKN	UKN	UKN	1158	UKN	Outer cap hinge broken; Needs new expander cap, Well not on map
EMW-7	45.01	37.84	198.47	37.84	160.63	TNA	UPPER	Blocked by pipe storage; no lock
UKN	47.18	39.55	UKN	UKN	UKN	1240	UKN	Lock cut; Not numbered; Dirt on bottom of probe; well location is NE of Unit 5 at RR spur
UKN	43.31	37.78	UKN	UKN	UKN	1314	UKN	Well location is opposite EMW-3
UKN	19.74	19.38	UKN	UKN	UKN	TNA	UKN	Well location is opposite EMW-3
UKN	NR	NR	UKN	UKN	UKN	TNA	UKN	Two wells adjacent to EMW-2; Not read
UKN	23.85	15.27	UKN	UKN	UKN	1200	UKN	Ok-rusty outer; Well location is opposite 6B
UKN	148.81	37.81	UKN	UKN	UKN	1203	UKN	Rusty outer, clay residue on tape-silt? Well location is opposite 6C
UKN	44.33	37.88	UKN	UKN	UKN	TNA	UKN	Good condition; well location is opposite EMW-7

Notes:
UKN — Unknown
TNA — Time Not Available
NF — Not Found
Did not check four offsite wells: OFF-MW1, -MW2, -MW3, AND -MW4
All well depths and static water levels are from the top of the casing
All top of casing elevations are in feet above North American Vertical Datum (NAVD)

Appendix C
Photographic Log

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 1: View of wells 1MW-1 (background) and 1MW-7 (foreground).

Photo 2: View of well 1MW-2.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 3: View of well 1MW-3.

Photo 4: View of well 1MW-5.

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West Helena, Arkansas
Photographic Log

Photo 5: View of wells 2MW-4 (left) and 2MW-1 (right).

Photo 6: View of wells 2MW-5 (left) and 2MW-2 (right).

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 7: View an unidentified well (far left) and wells 2MW-6 (middle) and 2MW-7 (right).

Photo 8: View of well EMW-1.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 9: View of two unidentified wells (foreground and background) and well EMW-2 (middle).

Photo 10: View of well EMW-3.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 11: Close-up view well EMW-3.

Photo 12: View of an unidentified well near EMW-3.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 13: View well EMW-4 (background) and an unidentified well (EMW-4b) located north of EMW-4 (foreground).

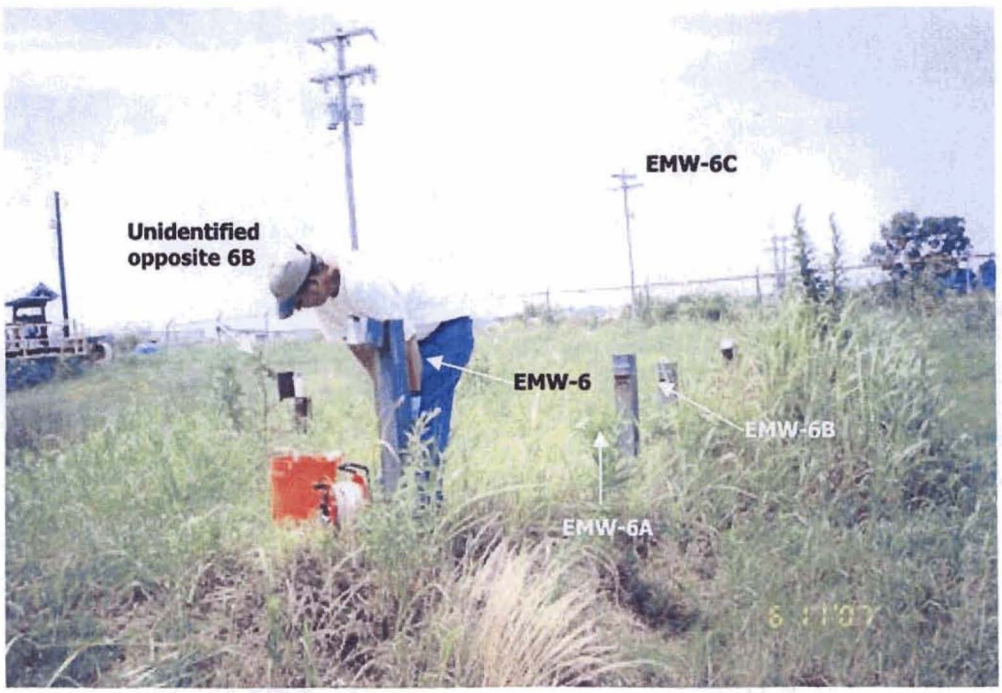

Photo 14: View wells EMW-6, EMW-6A, EMW-6B, EMW-6C, and an unidentified well.

Cedar Chemical
West Helena, Arkansas
Photographic Log

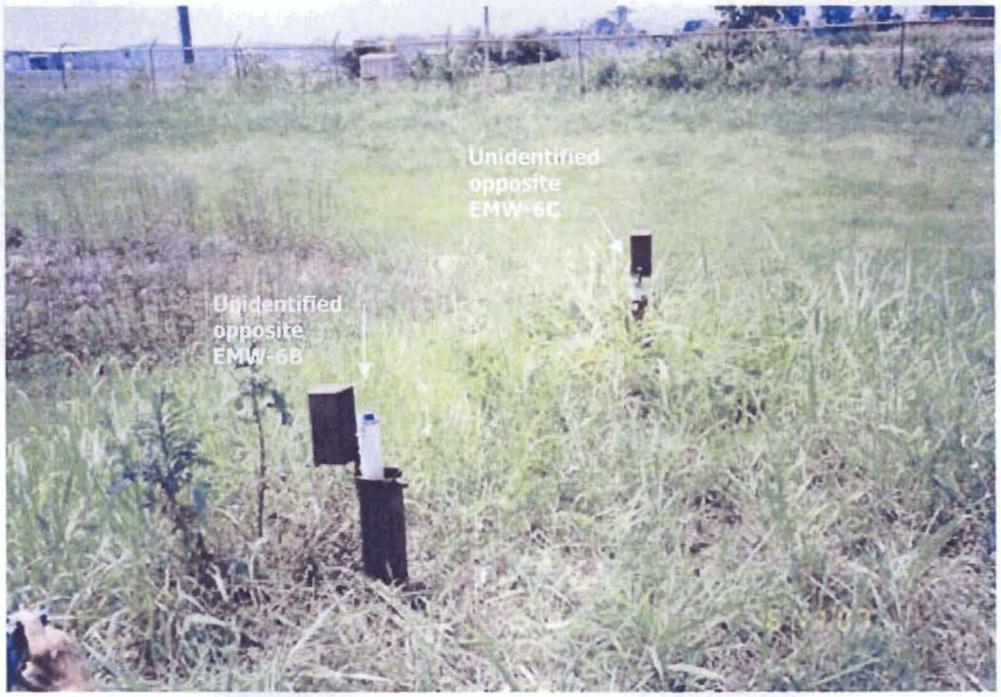

Photo 15: View of an unidentified well opposite EMW-6B and one opposite EMW-6C.

Photo 16: View of well EMW-7.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 17: View of unidentified well opposite EMW-7.

Photo 18: View of unidentified well northeast of Unit 5 at railroad spur.

Cedar Chemical
West Helena, Arkansas
Photographic Log

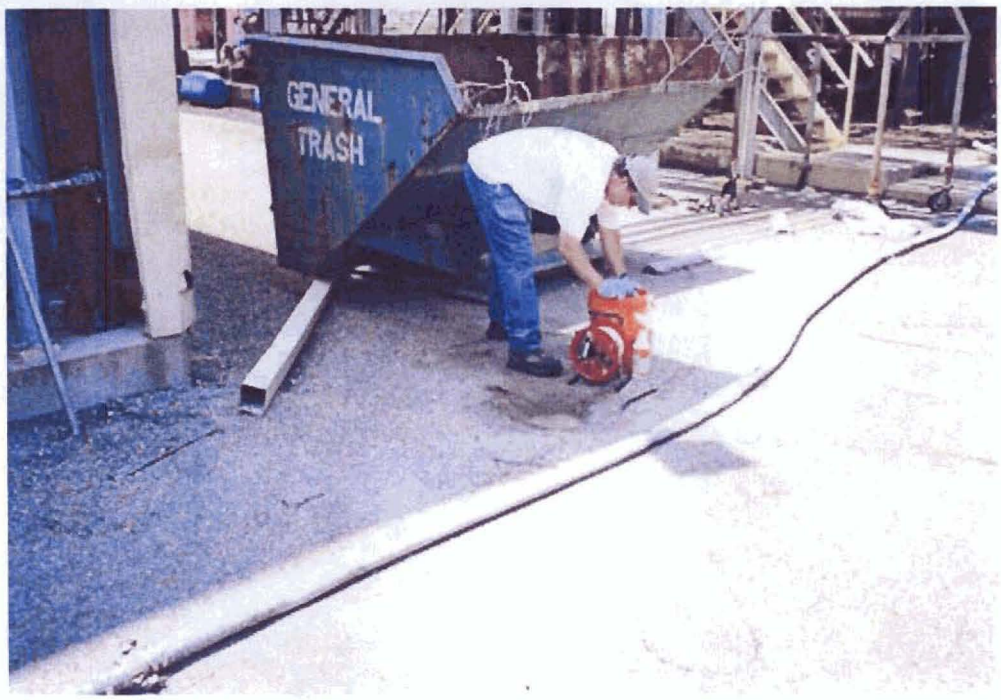

Photo 19: View of well 4MW-1.

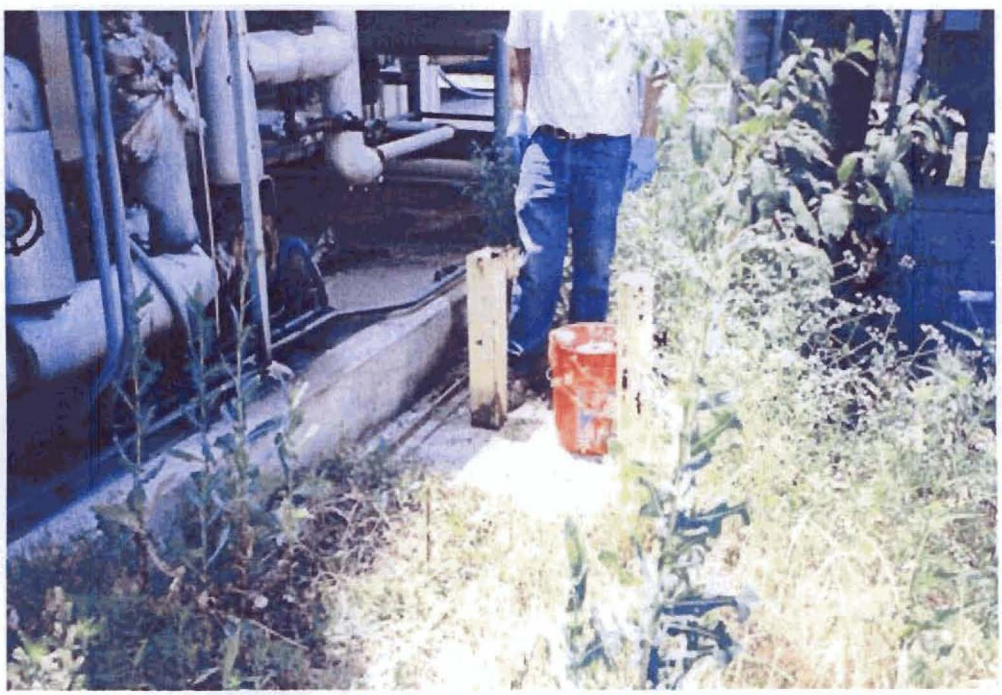

Photo 20: View of well 4MW-3.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 21: Clearing brush around well 4MW-3.

Photo 22: View of well 4MW-4.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 23: View of well CED2-MW3.

Photo 24: View of well 9MW-1.

Cedar Chemical
West Helena, Arkansas
Photographic Log

Photo 25: View looking northeast from well 2MW-5.

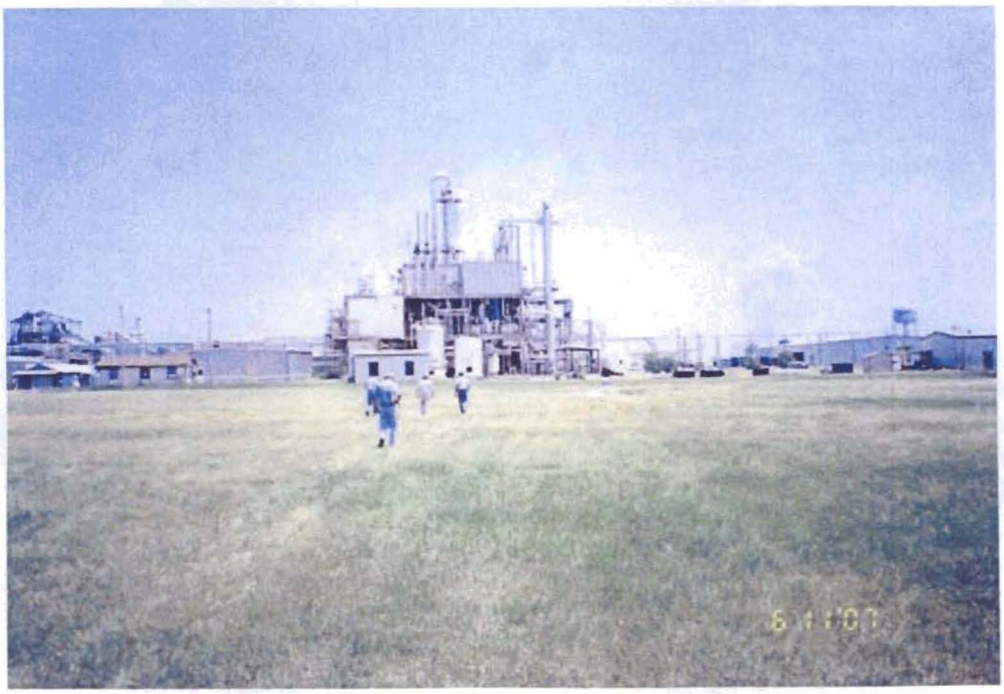

Photo 26: View looking east towards Unit 6 from 2MW-5.